

Amendment to the Claims:

Claims 10-18, 22-24 and 30-34 are pending. Claims 16-18 and 32-34 have been amended and claims 1-9, 19-21 and 25-29 have been cancelled.

Listing of Claims:

Claims 1-9 (Cancelled)

¹
~~10~~ (Original) A method of applying an inverse three-dimensional discrete wavelet transformation (3D IDWT) to a plurality of transformed video image sub-blocks, said sub-blocks comprising transformed frames, and said frames comprising rows and columns, said method comprising:

inverse transforming the sub-blocks of transformed video images by:

- a
- (1) applying a bit-based conditional decoding to the embedded zero tree encoded DWT coefficients of the block to obtain a DWT coefficient matrix;
 - (2) up-sampling respective sub-blocks of the DWT coefficient matrix by row, column and frame;
 - (3) filtering and combining one or more respective pairs of up-sampled sub-blocks to produce an up-sampled sub-block corresponding to each respective pair;
 - (4) reapplying (3) to any produced up-sampled sub-block pairs until one up-sampled sub-block remains;
 - (5) multiplying the one remaining up-sampled sub-block by eight to produce a block at the next higher resolution.

²
~~11~~ (Original) The method of claim ~~10~~¹, wherein the respective sub-blocks of the DWT matrix comprise eight sub-blocks.

³
~~12~~ (Original) The method of claim ~~10~~¹, wherein filtering and combining one or more respective pairs of up-sampled sub-blocks comprises applying an inverse low-pass filter to one up-sampled sub-block of the pair and applying a high-pass filter to the other up-sampled sub-block of the pair.

⁴
~~13~~ (Original) The method of claim ~~10~~¹, wherein up-sampling comprises inserting alternate frames, alternate columns and alternate rows.

Σ
5
~~14~~ (Original) An integrated circuit comprising:

an architecture to apply an inverse three-dimensional discrete wavelet transformation (3D IDWT) to a plurality of transformed video image sub-blocks, said sub-blocks comprising transformed frames, and said frames comprising rows and columns;

said architecture adapted to inverse transforming the sub-blocks of transformed video images by:

(a) applying a bit-based conditional decoding to the embedded zero tree encoded DWT coefficients of the block to obtain a DWT coefficient matrix; (b) up-sampling respective sub-blocks of the DWT coefficient matrix by row, column and frame; (c) filtering and combining one or more respective pairs of up-sampled sub-blocks to produce an up-sampled sub-block corresponding to each respective pair; (d) reapplying (c) to any produced up-sampled sub-block pairs until one up-sampled sub-block remains; and (e) multiplying the one remaining up-sampled sub-block by eight to produce a block at the next higher resolution.

Q1
6
~~15~~ (Original) The integrated circuit of claim ~~14~~ 5, wherein said architecture comprises at least one of the following: hardware, software, firmware, and any combination thereof.

7
~~16~~ (Currently Amended) The integrated circuit of claim ~~15~~ 5 ~~14~~, wherein the respective sub-blocks of the DWT coefficient matrix comprise eight sub-blocks.

8
~~17~~ (Currently Amended) The integrated circuit of claim ~~15~~ 5 ~~14~~, wherein filtering and combining one or more respective pairs of up-sampled sub-blocks comprises applying an inverse low-pass filter to one up-sampled sub-block of the pair and applying a high-pass filter to the other up-sampled sub-block of the pair.

9
~~18~~ (Currently Amended) The integrated circuit of claim ~~15~~ 5 ~~14~~, wherein up-sampling comprises inserting alternate frames, alternate columns and alternate rows.

[Claims 19-21 (Cancelled)

10
~~22~~ (Original) An article comprising: a storage medium having stored thereon instructions, said instructions, when executed by a computing platform, resulting in applying an inverse three-dimensional discrete wavelet transformation (3D IDWT) to a plurality of transformed video image sub-blocks, said sub-blocks comprising transformed frames, and said frames comprising rows and columns, by:

- (1) applying a bit-based conditional decoding to the embedded zero tree encoded DWT coefficients of the block to obtain a DWT coefficient matrix;
- (2) up-sampling respective sub-blocks of the DWT coefficient matrix by row, column and frame;
- (3) filtering and combining one or more respective pairs of up-sampled sub-blocks to produce an up-sampled sub-block corresponding to each respective pair;
- (4) reapplying (3) to any produced up-sampled sub-block pairs until one up-sampled sub-block remains; and
- (5) multiplying the one remaining up-sampled sub-block by eight to produce a block at the next higher resolution.

¹¹
~~23~~ (Original) The article of claim ¹⁰~~22~~, wherein the respective sub-blocks of the DWT coefficient matrix comprise eight sub-blocks.

¹²
~~24~~ (Original) The article of claim ¹⁰~~22~~, wherein filtering and combining one or more respective pairs of up-sampled sub-blocks comprises applying an inverse low-pass filter to one up-sampled sub-block of the pair and applying a high-pass filter to the other up-sampled sub-block of the pair.

Claims 25-29 (Cancelled)

¹³
~~30~~ (Original) A system comprising:
an integrated circuit, a memory, and a bus coupling said integrated circuit and memory;

wherein said integrated circuit comprises an architecture to apply an inverse three-dimensional discrete wavelet transformation (3D IDWT) to a plurality of transformed video image sub-blocks, said sub-blocks comprising transformed frames, and said frames comprising rows and columns;

said architecture adapted to inverse transforming the sub-blocks of transformed video images by:

(a) applying a bit-based conditional decoding to the embedded zero tree encoded DWT coefficients of the block to obtain a DWT coefficient matrix; (b) up-sampling respective sub-blocks of the DWT coefficient matrix by row, column and frame; (c) filtering and combining one

or more respective pairs of up-sampled sub-blocks to produce an up-sampled sub-block corresponding to each respective pair; (d) reapplying (c) to any produced up-sampled sub-block pairs until one up-sampled sub-block remains; and (e) multiplying the one remaining up-sampled sub-block by eight to produce a block at the next higher resolution.

¹⁴
~~31~~ (Original) The system of claim ¹³~~30~~, wherein said architecture comprises at least one of the following: hardware, software, firmware, and any combination thereof.

¹⁵
~~32~~ (Currently Amended) The system of claim ¹³~~31~~, wherein the respective sub-blocks of the DWT coefficient matrix comprise eight sub-blocks.

¹⁶
~~33~~ (Currently Amended) The system of claim ¹³~~31~~, wherein filtering and combining one or more respective pairs of up-sampled sub-blocks comprises applying an inverse low-pass filter to one up-sampled sub-block of the pair and applying a high-pass filter to the other up-sampled sub-block of the pair.

¹⁷
~~34~~ (Currently Amended) The system of claim ¹³~~31~~, wherein up-sampling comprises inserting alternate frames, alternate columns and alternate rows.

Amendments to the Abstract

Please replace the abstract with the following amended abstract:

Embodiments of a three-dimensional wavelet transform are described. An inverse three-dimensional discrete wavelet transformation (IDWT) is applied to a plurality of transformed video image sub-blocks. The sub-blocks of transformed video images are inverse transformed by applying a bit-based conditional decoding to the embedded zero tree encoded DWT coefficients of the block to obtain a DWT coefficient matrix, up-sampling respective sub-blocks of the DWT coefficient matrix by row, column and frame, filtering and combining one or more respective pairs of up-sampled sub-blocks to produce an up-sampled sub-block corresponding to each respective pair, reapplying the filtering and combining step to any produced up-sampled sub-block pairs until one up-sampled sub-block remains and multiplying the one remaining up-sampled sub-block by eight to produce a block at the next higher resolution.



ABSTRACT

Embodiments of a three-dimensional wavelet transform are described. An inverse three-dimensional discrete wavelet transformation (IDWT) is applied to a plurality of transformed video image sub-blocks. The sub-blocks of transformed video images are inverse transformed by applying a bit-based conditional decoding to the embedded zero tree encoded DWT coefficients of the block to obtain a DWT coefficient matrix, up-sampling respective sub-blocks of the DWT coefficient matrix by row, column and frame, filtering and combining one or more respective pairs of up-sampled sub-blocks to produce an up-sampled sub-block corresponding to each respective pair, reapplying the filtering and combining step to any produced up-sampled sub-block pairs until one up-sampled sub-block remains and multiplying the one remaining up-sampled sub-block by eight to produce a block at the next higher resolution.